

REMARKS

As a preliminary matter, claim 1 stands objected to as being indefinite. Specifically, the Examiner asserts that the phrase “a maximum driving voltage” must have a specified numeric quantity. Applicants respectfully disagree, and traverse.

The “maximum driving voltage” is dependent on the output voltage of a driver IC for driving a liquid crystal. Therefore, a numeric quantity for the maximum driving voltage may not be specified without first determining all of the relevant individual parameters and characteristics of the driver IC in question. The Examiner’s assertion is thus erroneous.

Nevertheless, in order to expedite prosecution, Applicants have amended independent claim 1 to further recite “a liquid crystal driving unit capable of outputting driving voltages less than or equal to a predetermined maximum driving voltage.” Applicants submit that this newly recited feature clarifies that the maximum driving voltage is predetermined, and also distinguishes the maximum driving voltage from any other regular and/or lesser driving voltage of the device. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objection to claim 1 in light of these reasons and this amendment.

As a second preliminary matter, claims 2, 6, 10, and 14 stand objected to for not citing a unit for the dielectric constant. With respect to claims 6, 10, and 14, these claims have been canceled, rendering this objection now moot. The subject matter of claim 2, on the

other hand, has been incorporated into independent claim 1, and Applicants therefore traverse this objection as follows.

Applicants wish to point out to the Examiner that claim 2 (and now claim 1) did not cite merely a “dielectric constant,” as stated by the Examiner, but instead a “relative dielectric constant.” This distinction is important, because the two are not equivalents. The relative dielectric constant requires no units, whereas a dielectric constant does. The relative dielectric constant is a non-unit value which is obtained by dividing a dielectric constant of a substance (in units of F/m) with a dielectric constant of a vacuum (also in units of F/m). Accordingly, Applicants submit that this explanation not only overcomes the outstanding objection to claim 2 (and therefore now 1), but also more clearly distinguishes how the Examiner’s comparison of the dielectric constant disclosed by the Nishi reference (U.S. 5,541,747), discussed below, is not analogous to the relative dielectric constant of the present invention.

As a third preliminary matter, claim 9 stands objected to for a typographical error. Applicants have corrected the typographical error noted by the Examiner, and respectfully request reconsideration and withdrawal of the outstanding objection thereto in light of this amendment.

Claims 1-2, 5-6, 9-10, and 13-14 stand rejected under 35 U.S.C. 102(b) as being anticipated by Nishi. Applicants respectfully traverse this rejection because the portion of Nishi cited by the Examiner is drawn toward the behavior of spontaneous polarization of a

ferroelectric thin film, whereas the present invention is drawn toward the behavior of spontaneous polarization of a liquid crystal material having spontaneous polarization when a certain voltage is exceeded.

In his rejection, the Examiner cites col. 9, lines 3-15 and col. 12, lines 16-20 of Nishi against the present invention. Applicants submit, however, that these text portions of Nishi are inapplicable to the present invention. First, neither text portion teaches or suggests the relationship of spontaneous polarization in the liquid crystal in relation to the maximum driving voltage. In fact, the cited text from col. 12 does not even refer to the spontaneous polarization in the liquid crystal at all, but only to spontaneous polarization of the *ferroelectric thin film*. Accordingly, the cited portion from col. 12 is not at all analogous to the present invention.

The cited text from col. 9, on the other hand, does mention spontaneous polarization in relation to liquid crystal, but does not teach or suggest what relationship this spontaneous polarization would have to the maximum driving voltage of such a device. In fact, this portion of Nishi specifically teaches away from any specific relationship between the maximum driving voltage and the spontaneous polarization.

Nishi teaches that “in practice, it is necessary that electric charge several times (1 to 5 times) as much as the above-described value be supplied...” (Emphasis added). First, although the Examiner asserts that the “value” stated by Nishi refers to the spontaneous polarization, Applicants submit that Nishi’s “value” could also refer to several other “values”

taught in the same portion of text. Nevertheless, even if the Examiner's interpretation were correct, namely, that Nishi refers to the spontaneous polarization, Nishi would still teach away from the present invention.

Second, and in contrast to the present invention, which recites a specific relationship between the spontaneous polarization and a maximum driving voltage, Nishi only states that the electric charge should be "several times as much." In fact, Nishi here teaches that this relationship is not fixed, but variable between "1 to 5 times" as much. Accordingly, Applicants submit that it would be impossible to derive the exact formula recited in the claims to the present invention from the vague and variable teachings of Nishi.

Additionally, as briefly discussed above, claim 1 has been further amended to feature a liquid crystal driving unit, which better distinguishes between lesser output driving voltages and the maximum driving voltage in question. Nishi neither teaches nor suggests any distinction between any two kinds of output driving voltages. Based on this feature alone therefore, the Section 102 rejection is further traversed, and should be withdrawn.

Furthermore, claim 1 has also been amended to feature the subject matter from claim 2, namely that of the relative dielectric constant. Moreover, Applicants have further defined the relative dielectric constant to more clearly feature that such a relative dielectric constant is not affected by the spontaneous polarization. Applicants submit that Nishi also fails to teach or suggest any such features with regard to both the relative dielectric constant

and one which is unaffected by the spontaneous polarization. Accordingly, for at least these reasons as well, the Section 102 rejection should be withdrawn.

Additionally, Applicants again point out that, in establishing his Section 102 rejection, the Examiner compares the dielectric constant 106pF/m as being analogous to the relative dielectric constant of the present invention, which is recited to be more than 3. Applicants again submit that the analogy is inappropriate. First, Nishi's dielectric constant is not a relative dielectric constant, as noted above. Second, the dielectric constant from Nishi that was cited by the Examiner is clearly shown to be affected by the spontaneous polarization, as demonstrated in equation (3) of Nishi. (See col. 17, line 6). In this respect as well, even if Nishi did teach a relative dielectric constant separately from its disclosed dielectric constant, Nishi could not demonstrate how such a relative dielectric constant could be independent of the spontaneous polarization. For these reasons as well, the rejection is further traversed.

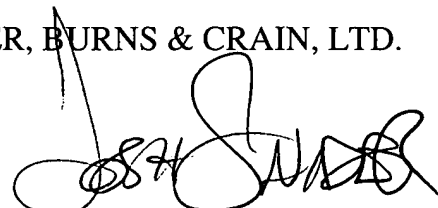
Claims 3-4, 7-8, 11-12, and 15-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of Ishii et al. (U.S. 5,642,214). Applicants respectfully traverse this rejection for at least the reasons discussed above. These rejected claims are all either directly or indirectly dependent from independent claim 1, and therefore include all of the features of the base claim, plus additional features. Neither of the two cited references, whether taken alone or in combination, teach or suggest a relative dielectric constant that is not affected by the spontaneous polarization.

For all of the foregoing reasons, Applicants submit that this Application, including claims 1, 3-5, 7-9, 11-13, and 15-16, is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted

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By

A handwritten signature in black ink, appearing to read "Josh C. Snider", is written over the printed name.

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